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ABSTRACT

In an attempt to import some concepts from general systems theory to the theory of librarianship, basic elements in the theory of librarianship were identified, interrelated in a form of a static model, and projected into a possible, dynamic pattern of change. (Author/LS)

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TOWARD A CONCEPTUAL PATTERN IN LIBRARIANSHIP: A MODEL

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INTRODUCTION

In outlining concepts of general systems theory, Kenneth Boulding suggests two basic approaches to organizing theoretical systems. One is a system of theories based on selected phenomena common to many disciplines. The other approach is an arrangement of various theories by the degree of complexity of organization of their basic concepts. A hierarchical structure would reveal gaps in theoretical formulations between various levels of abstractions and would lead the way toward the unification of knowledge at some higher level. He starts with the level of frameworks, describing the static relations between basic elements. As he points out, "even at this simplest level, however, the problem of the adequate description of complex structures is still far from solved. The theory of indexing and cataloging, for instance, is only in its infancy. Librarians are fairly good at cataloging books . . . The cataloging of events, ideas, theories . . . has hardly begun. The very multiplication of records, however, as times goes on, will force us into much more adequate cataloging and reference systems than we now have. This is perhaps the major unsolved theoretical problem at the level of the static structure." [1]

In this paper, basic elements in the theory of librarianship are identified, interrelated in a form of a static model, and projected into a possible, dynamic pattern of change. This is perhaps one of the first attempts to import some concepts from general systems theory to the theory of librarianship. [2]

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In its present stage, the field of Library Science manifests a basic duality: a "know-how" of operations, more or less exactly defined in library procedures, and an intuitive, never clearly formulated, "know-why" of library theory. The "know-how" deals with library artifacts, books, and it is a subject of empirical, trial-and-error experimentation in the search for the most efficient ways to serve library users. The formulation of "know-why" is often written off as useless philosophizing not applicable to the applied discipline. As a result, we currently have a relatively well-developed technical knowledge with practically no theoretical models which could explain the intellectual nature of library technology. Yet, librarianship is, in essence, a field dealing with mental processes, and our product is not a physical book itself, but the transmission of its content.

The current library literature illustrates well the shortcomings of the field. The prolific output in subjects dealing with library technology indicates a rapidly developing empirical theory of librarianship. The number of studies in the sociology of librarianship, although less specific in nature, is equally large. The writings in the philosophy of librarianship relating the two approaches are disproportionately small. Librarians are quite literate in issues concerning the procedural and contextual aspects of their discipline, but they know very little about the conceptual common ground for these two approaches. This common ground can be termed a Library System, a set of concepts interrelating the needs of the library users with the means by which the library meets these needs.

The overall tone of this paper is an inquiry concerning the possibility of constructing a hypothetical model for a Library System. Such a model should not be considered as a practical, working formula for library operations, but rather, as an illustration of a kind of orientation, or philosophy, in Library Science. The model itself, although crude and obscure, can be replaced by a more sophisticated generalization. Significant in constructing the model is the emphasis on the study of conceptual relations, which can contribute to a better understanding of the nature of librarianship.

In a broad sense, the aim of librarianship is to facilitate the transmission of ideas from recorded knowledge to the potential user by means of collecting, arranging, and distributing the carriers of information. Hence, Library Science, as a science, ought to deal with a body of theories aiming at the description, explanation, and prescription of library practices. In turn, the philosophy of librarianship should seek to: (a) formulate the concept of the nature of librarianship in terms of basic principles (determining various approaches in the theory of librarianship) and (b) interrelate these principles into a coherent theory which would encompass all approaches formulated within the limits of the discipline.

Thus, a distinction must be made between a philosophical statement *about* librarianship and the philosophical studies *within* the discipline. The former interrelates various branches of librarianship by providing a map of the discipline. The latter elaborates on specific regions of the map.

This paper discusses selected issues in the philosophy of librarianship. It rests on the taxonomy developed elsewhere [3] which defines the subject matter of librarianship in terms of the relationship between the carriers of information, commonly referred to as books *(B)*, the library user *(U)*, and the aspects of knowledge transmitted *(K)*. The corresponding acronym *BUK*, stands for the basic or primitive terms of a three-fold approach to librarianship. Each approach attempts to solve a unique set of problems as follows: (a) technological problems revealed by the study of the implementation of library objectives (procedural approach), (b) semantic difficulties encountered in defining library concepts (conceptual approach), and (c) pragmatic task to evaluating the effectiveness of library operations in terms of the context of providing library services to users (contextual approach).

The objectives of this paper are:

to delineate some essential characteristics which define the meaning of the library concepts, i.e., to outline a conceptual structure of librarianship, and

to build a model of change in library concepts.

CONCEPTUAL MODEL

In this section, a model for the conceptual relationship between the components of the *BUK* approach is developed and discussed. The conceptual relationship is defined in terms of the internal similarities between *B*, *U*, and *K* as the component parts and the external similarities between *B*, *U*, and *K*, each considered as an independent *whole* unit. The intended model should provide a structural arrangement of different kinds of characteristics. A pattern for the development of the concepts should emerge from the study of the relationships depicted by the model.

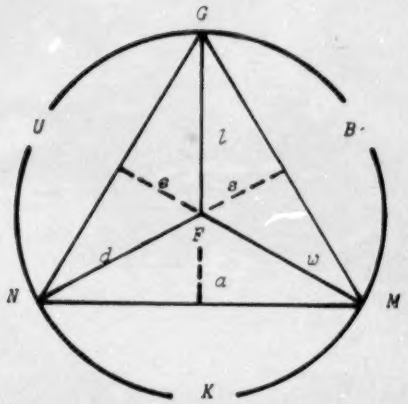
A Model for a Conceptual Library System

Constituents. The conceptual relationship between *B*, *U*, and *K* is discussed in terms of four constituents (1) need *(N)*, an awareness of a necessity to attain certain goals; (2) goal *(G)*, a specific end or objective sought; (3) means *(M)*, an act, instrument, or method used in attaining a goal; and (4) fulfillment *(F)*, the state of actual completion of a task at any given moment.

The constituents can be considered as universal components in the *B-U-K* relationship, since each is present in every library situation. A library patron, for example, is motivated by a need to use the facilities of the library in terms of a specific goal, the fulfillment of which is related to the use of the means (or facilities) offered by the library. Similarily, each library procedure is originated by a need to achieve certain objectives that designates the means for fulfilling these goals.

Attributes. The degree of interrelationship between the four constituents can be expressed in terms of the three universal elementary attributes of (1) efficiency *(e)* of a particular means in reaching the goals or its complement, waste *(w)*; (2) satisfaction *(s)* expressing the degree of fulfillment of a need or its complement, dissatisfaction *(d)*; and (3) lacuna *(l)* indicating the disparity between goals aimed at and the degree of their fulfillment or its complement, achievement *(a)*.

Definition of a Library System. A conceptual library system, defined in the above terms, is illustrated in Figure 1.



B carrier of information
U user
K content of carrier of information *B*
s satisfaction
d dissatisfaction
e efficiency
w waste
a achievement
l lacuna
N need
M means
G goal
F fulfillment

Figure 1. Conceptual Relationship between Elements in Library Science

In this illustration, the system itself is enclosed within a triangular pyramid *(FGMN)* that represents the total relationship between the sub-systems $B(\Delta FGM)$, $U(\Delta FGN)$, and $K(\Delta FMN)$ in terms of elements *F*, *G*, *M*, and *N* and their attributes *e*, *a*, and *s*.

Thus, a carrier of information *B*, (e.g., book) can be defined in this system as a means *M* employed for the achievement of goal *G*. Its efficiency *e* is related to the gap *l* between goal *G* and its fulfillment *F*.

The library user *U* is conceived as an agent fulfilling his needs *N* to attain the goal *G*. The agent's satisfaction *s* in fulfilling the goal and its achievement *l*.

The knowledge K transacted in the library is interpreted as the information contained in the carrier of information B fulfilling the need of the user U. The transaction is evaluated in terms of its efficiency e and the satisfaction s resulting from that fulfillment. Central in this model is the study of the notion of a system, not its component parts. The objective is to isolate and analyze conceptual forces shaping a given pattern of behavior within the system. It is analogous to the study of the behavior of a magnetic field considered independently from the metallic substances or electric sources which generate the magnetic force. Thus, the attention is focused, not on the properties of elements making up the Library System, but on the internal forces within the Library System that are responsible for certain static or dynamic relations.

Conceptual classification. The model for the library system is based on the conceptual classification shown in Figure 2.

Approach	Primitive Terms	Relations Between Subsystems	Formators (Constituents)
Quantitative (Primary)	B U K	Δ GMN	N M G
Qualitative (Secondary)	e ; ω s ; d a ; l	Δ FGM Δ FGN Δ FMN	F

Figure 2. Conceptual Classification

The primitive terms are here considered as the primary elements of library science, each meaningful only in terms of triadic relations: that is, we are not concerned with the carrier of information B, the user of library material U, or the knowledge sought K as such, but in the relations between them. Similarily, the efficiency e, satisfaction s, and the achievement a, can each be defined only in terms of the other two.

Each complex relationship becomes an autonomous sub-system of the library system. Each sub-system can be analyzed in terms of its constituent relationship.

The formators are the specific constituents of the primitive terms. They are indispensible in the definitions (or in the formulation) of the primitive terms. Thus, need, means, goals, and fulfillment are the components of the relationship between the primary terms B, U, and K within the secondary terms e, s, and a.

The distinction between the quantitative approaches point out two kind of variations in the primitive terms. These are variations in (a) the degree of extensive "quantity" expressible numerically (primary terms) and in (b) the kind of intensive "quality", a non-numerical expression of accomplishment and its significance (secondary terms).

Our use of the notions *quantity* and *quality* is relative. Calling the primary terms *quantitative* is not meant to endow them with a physical or measurable existence, but rather to point out that they exist on a somewhat lower level of *abstraction* than the secondary terms. For example, B could be interpreted as some sort of statistical representative of *books* in general or U as an *average user*, while e can only be interpreted after B has been defined.

Both the quantitative and qualitative approaches deal with the formators (F, G, M, N) that are inherent in any relationship and which are inseparable from the relationship. Thus, no conceptual relationship between B, U, and K can be perceived in Library Science without considering F, M, N, and G. Furthermore, any specific relationship between B, U, and K can be discussed only in terms of the corresponding M, N, and G.

Library Science is a service-oriented discipline, and any evaluative approach involves an estimation of success in performing certain tasks. Thus, the qualitative approach is always related to fulfillment F, which influences highly the variable qualities of e, s and a and is dependent on a specific configuration within the relationship itself.

The quantitative approach is basically a procedural study of *physical* properties, while the qualitative approach is essentially a contextual study of the effect of given properties on the overall relationship.

These two approaches in the areas of the theory of applied librarianship and the sociological evaluation of Library Science are familiar to librarians. These two essentially independent approaches are not the subject of our direct concern, but their conceptual interrelationship is at the core of the model.

Laws Governing Basic Relationships

Fundamental relationships between the constituents and their attributes (Figure 1) can be analyzed at three different levels: structural, operational, and valuational.

Basic Law of Structure. The conceptual interrelationship between the basic constituents (F, G, M, N) defines a library system at any given point and can be express symbolically as:

$$(B + U + K) = \Delta,$$

where Δ = "degree of competence". If Δ is constant, any change in the total configuration of primary terms $(B + U + K)$ results in a change in the total configuration of secondary terms $(s + e + a)$ and conversely, any change in the secondary terms affects the total configuration of

primary terms. Interpreting the terms as components of the diagram, we see that any change in the formators affects the configuration.

Operational Law. The operational interrelationship between the primitive terms B, U, and K defines a given library system in terms of the quantitative characteristics of each term. These quantitative characteristics are expressed in terms of their impact on the total B-U-K relationship.

Propostion 1 (Operational law).

$$B + U + K = \Omega \qquad \text{where } \Omega = \frac{\Delta}{s + e + a}$$

Valuational Law. The valuational interrelationship between the attributes e, s, and a in any given library system defines the qualitative characteristics of each primitive term. Since e, s, and a converge at the point F, the fulfillment of a goal becomes a common denominator for each attribute.

Proposition 2 (Valuational law).

$$s + e + a = \Sigma \qquad \text{where } \Sigma = \frac{\Delta}{B + U + K}$$

The Basic Law of Structure and its two derivates may help clarify some of the commonly held misconceptions about library competence. One such erroneous conception is a notion that the competence of a particular library can be improved by manipulating its basic components. Yet, means M, needs N, goals G and their fulfillment F, are the formators of library operation in the same way that the horse-power of an engine determines the optimum power of a car. Library performance is manifested by its operation within prescribed limits of M, N, G, and F. To claim the ability to change these limits is to consider oneself external to the library system.

Another mistaken notion is the view that one may have an *excellent* library in a *mediocre* university. The degree of competence is defined in the Basic Law of Structure in terms of the totality of B-U-K and s-e-a characteristics. Each of these two groups of factors can be visualized as a proverbial *black box*. The conceptual excellence is measured in terms of relationships between the contents of these two boxes. In each of these two boxes, the library user, his interest in the services offered by the library, and the library's success in meeting these needs are important factors of excellence. A well-selected collection with a high-level service organization above and beyond the needs of its users is no more useful to a service institution than a cannon is useful in hunting pigeons. Both are conceptually wasteful.

In the same vein, any attempt to develop formulas for measuring the competence of a library in terms of physical volumes in its collection overlooks an essential characteristic of competence: the fact

that the size of the collection B is related not only to the number of potential users U and the fields of curriculum concentration K, but it also reflects the efficiency of a particular collection E in contributing to the user's satisfaction s in achieving the intended goals a. These are subjective yet essential attributes of library service.

An increase in the number of physical volumes may increase the degree of competence, if s, e and a remain constant (i.e., additions of well-selected volumes in terms of s, e, and a). An increase in competence may also be achieved by proper improvement in s, e, and a with B-U-K constant (e.g., through an improved accessability of the collection). But the measurement of competence itself (the consideration of the *value* of Δ) can be expressed satisfactorily only in terms of all the elements of competence. Similarily, legal competence is defined in terms of certain qualifications in addition to "the minimal requirements of age, soundness of mind, citizenship", etc. Likewise, a competent art collection is distinguished not only by the number of paintings it contains, but also by the number of outstanding esthetic characteristics of each painting.

Any formula for minimum adequacy is, at best, an educated guess as to what sized library collection provides enough variety to satisfy the needs of the average user. In effect, such formulas suggest the optimal size for minimal needs.

A PATTERN OF CHANGING CONCEPTS

The conceptual developmnet of the model is governed by principles that are equally valid for any other theoretical system. The generalizations concerning such patterns of change are formulated by general systems theory and are justified by historical observations of the development of scientific thought. "As we survey the evolution of modern science," notes Bertalanffy, "we find the remarkable phenomenon that similar general conceptions and viewpoints have evolved independently in the various branches of science . . . in the past centuries, science tried to explain phenomena by reducing them to an interplay of elementary units which could be investigated independently of each other. In contemporary modern science, we find in all fields conceptions of what is rather vaguely termed *wholeness*".

General systems theory is a mathematico-logical study of principles shared by different disciplines in science and its objective is to formulate and deduce principles that are valid for any system in general. The principles are derived by the hypothetico-deductive method. Since general systems theory is stated in mathematical language, its elements are considered in terms of their measurable, quantitative characteristics.

The objective of this section is to attempt to trace some of the principles governing the dynamics of library change as interpreted in our model. These can be formulated by analogy with general systems theory. One may, however, point also to the basic difference between some general systems models that adapt conceptual models to physical reality and this conceptual model that seeks to relate physical models to conceptual reality. The analogy of this conceptual model with

general systems theory rests on three assumptions. These assumptions are that (1) a correspondence exists between qualitative aspects of physical structure of abstract concepts of abstract concepts in our model, (2) a similarity exists between the qualitative behavior of physical systems and the conceptual behavior of abstract systems, and (3) concepts in Library Science are constructed in terms of "facts" which exist independently of our theories about them.

Meaning of Concepts. The degree of meaningfulness of a concept is always measured in terms of the elements of which it is constituted. If a concept contains no elements, it is meaningless; if it has one element, its meaning is arbitrary; if concepts have two elements, there is only a tentative definition of their meaning. Thus, the meaningfulness of a concept is related to its complexity.

The significance of *meaning* is perhaps best emphasized by realizing that it indicates a relationship. Thus, *B* with reference to itself is an arbitrary statement (e.g., "a book is a book"); while *B* referred to *U* (e.g., "a book for its user") communicates a synonymy that relates a book to a user in a very loose sense. It is for this reason that the present theory is based on the relationships between at least three elements (*B-U-K*). This is the smallest and least complex primitive relation that is meaningful.

Subsystems of the model. Each of the primitive terms (*B, U, K*) could be analyzed in terms of its own component parts (e.g., size, quality and weight of paper, type of printings, etc., in *B*). It would, however, expand the theory of librarianship to other fields (e.g., theory in book-making). In this essay, the internal characteristics of *B*, *U*, and *K* are significant only in terms of their interrelations (i.e. the size of the book, the quality of its paper, etc., are important only to the extent they affect the transmission of knowledge *K* to the user *U*). Hence, no further subdivision beyond *B-U-K* is carried out. For example, in selecting a particular book one is concerned the portion of its features that are related to one's particular interest in the particular interest in the subject, and the other features that are not necessarily needed for one's own purposes are taken as part of the "package".

On the other hand, in *a*, *e*, and *a*, each element can refer to at least one *B-U-K* relation (e.g., satisfaction of the user in his selection of a given carrier of information *B* due to the amount of knowledge *K* it provides). For this reason each *a*, *e*, and *a* can be studied separately as a sub-system of the total library system. A change in the library system does not alter the basic library structure discussed previously, but rather goes on within the confines of these three basic subsystems. Thus, a study of library change involves the study of internal changes in the three subsystems *a*, *e*, and *a*.

Dependence and independence: structuring and non-structuring. Two concepts are independent of each other if they have no common components. The subsystems *a*, *e*, and *a* are not independent of each other since all three share the component *F*. Also, as stated in Proposition 2, the behavior of any one of the three subsystems affects the other two.

A concept is more or less structured as its constituent elements are more or less dependent on each other. The degree of structuring in *B*, *U*, and *K* depends on the situation in which the model is applied. The degree of structuring in the primary terms *B*, *U*, and *K* determines to some extent the degree of complexity of the subsystems *s*, *e*, and *a*. That is more structure there is inherent to *B-U-K*, the greater is the capacity of *s-e-a* for more constituent relations (and hence greater complexity).

In the library systems of primary terms (*GMN*), the unstructured concept of the *user* stands for the sum of mutually exclusive elements such as young readers, female patrons, professional library user. etc. This concept of user is expressed statistically as the total number of people requesting a service. The structured concept of the *faculty user* in the university library, on the other hand, is defined by the interrelationship of the various demands imposed on the library by its faculty. For example, a faculty member as teacher may seek instructional materials (i.e., secondary sources, such as textbooks), while the same faculty member,as a researcher,may also seek original material (i.e., primary sources, such as dissertations, experimental reports, etc). The interplay between these roles can be illustrated by the demands of a teacher-researcher in a graduate program. The relationship of his pedagogical interests and his research involvement results in his interest in doctoral students. This, in turn, sparks a demand for library materials too advanced for the course he teaches, yet too elementary for his own research. Thus, the structured concept of the faculty user involves in an essential way some *picture* of the various interrelated roles of a faculty member, and cannot be treated merely as a statistical sum.

Change in systems. A significant change in a subsystem can be defined as a change in its complexity, where a positive change increases and a negative change decreases the number of relevant relations making up a subsystem. A *steady state* exists when the complexity of the system remains constant. For example, a positive development in satisfaction *s* can be affected by intensifying the involvement of *B* with *F* by finding a more readable or informative book or by moving a book to make it more accessible. In either case, new ways of involving the "book" in the process of "fulfillment" are brought into play, thus increasing the number of relevant relations encompassed by the *s* of the system.

In this sense, for example, the microform may replace the book-form as a more convenient method of storing information or as a more useful tool for the reader. Only if both the storage and use of the microform become more satisfactory than those of the book-form can it replace the book-form as an accepted carrier of information. This is the principle that explains the evolution of the concept of book-form from papyrus, clay tablets, and parchment to the paper form.

Equilibrium. The library system naturally acts to increase the totality of *s*, *e*, and *a*. This is to say that it acts to counter *d*, *w*, and *i*. However, although dissatisfaction, waste, and lacuna can never be eliminated completely from a given library system, there may be certain configurations for which any small change will produce an increase in the totality of *d*, *w*, and *i*. Such configurations are called *positions of relative equilibrium*.

A library system will not move away from a state of equilibrium of its own accord. However, it is important to realize that while configurations near equilibrium may have larger total d, w, and l, there may be other configurations not so near to equilibrium that actually have a smaller total d, w, and l. A configuration with the lowest possible d, w, and l is called a *point of absolute equilibrium* and can be regarded in some sense as the "best possible" state of a given system.

The concept of equilibrium may be illustrated by analogy with the differences between traditional and progressive library organizations. A conceptually "traditional" library operates within rules established long ago. A user is viewed as a stereotype with predictable needs, and the types of services offered are well fossilized. The expansion of services is not anticipated; curtailment would meet user resistance, forcing the library to return to the old ways of service. A "progressive" library challenges the static concept by searching for new equilibria between *B-U-K* and *s-e-a*. However, the dynamism of this approach is not in a mere expansion of external factors such as enlarged library budget, changing profile of the undergraduate user, etc., since one can expand the pyramid *NMGF* by stretching its points proportionally, without altering the internal equilibrium. The dynamism of such a change is in the rearrangement (not the addition) of factors already in the system.

External change. The concept of equilibrium controls the internal change of a given system, for within the context of a given M, N and G, changes take place in the subsystems until the total complexity of the subsystems s, e, and a is maximized. However, it is also possible that the *conditions* of the library may change in some sense so that what was formerly an equilibrium state becomes a disequilibrium. For example, a change in the quality of a university may result in a revision of its library goals, affecting the *G-F* disparity and the total *s-e-a* configuration. Soon the system is undergoing internal change seeking a new equilibirum.

Leading elements. Within each subsystem, different constituent relations are endowed with differing relative weights. for certain components of a subsystem contribute more to its complexity than others. For example, in the illustration of the development of micro-forms vs. book-forms, the physical space occupies by a carrier of information, up to a certain critical size (of the collection), contributes less to its effectiveness than, for instance, its physical durability or the ease of reading. However, at some point in the growth of a collection (and in the technological development of micro-forms) considerations of space may take on a new importance. Thus, the effectiveness of a particular form (book-form) of B may change drastically relative to other forms of B.

Principles. In summary, these ideas and remarks are combined into some principles of change.

(a) *Principle of Internal Change.* A given library system (N, M and G fixed) will change so as to increase the total complexity of its sub-systems s, e, a (a positive change).

(b) *Corollary.* A library system will not normally move from a state of equilibrium.

(c) *Principle of External Change.* A change in the formators (*N-M-J*) changes the basic library system and induces change by altering placement of equilibria.

The more traditional the Library System, the more stationary are its component parts. One can change the status quo only by addressing oneself to the aspects of *s*, *e*, and *a* that were neglected previously. Thus, for instance, a search for a greater efficiency of technical services results in a more complex *e*, which in turn, affects the *s* and *a*. In the traditional concept of cataloging, for example, the quality of the information on a cataloging card was more important than the number of cards processed. Hence, a simplification of descriptive rule was more significant than the issue of speed in cataloging.

In the contemporary approach, the use of Library of Congress (LC) entries resolves the problem of quality cataloging. This allows the individual library to concentrate on the problems of quantity of card production, and improvements in the technology of reproduction affect technical services more than ever before. In the case of the traditional library, a small change in rules, such as corporate entry, would be far more significant than the introduction of new technology for photocopying. In the case of a progressive library, a major change from ALA to AA rules of descriptive cataloging is more or less taken for granted, since it is incorporated in the LC entry and accepted by the individual library "as is." Instead, attention is focused on minor changes in technology (such as the application of new equipment), since the modifications in this area may have a greater impact on the total services of a given library.

All three principles are illustrated indirectly in the major shift of interest underlying the contemporary debate on the application of computers to library operations. A whole range of issues, from the concept of main entry through filing rules to details affecting the esthetic appearance of a catalog card are being revised in terms of their adaptability to the computer system. Modern concepts, such as central processing, may alter considerably the relative significance of a number of elements in the library system through an external change within the subsystems (*s*,*e*,*a*).

It may be noted in passing that the retention of the *B-U-K* concept of the library system is critical in these changes. If, for example, the factor of cost is dominant in the centralized approach, it may overshadow the consideration of service to the library user. The profit motive of a commercial approach is not necessarily synonymous with the real needs of the library patron. Thus, one can envision an information center of the future centrally processing the carriers of information *B* with electronic retrieval of information *K* via teletype operated directly by the user *U*. If such technology were developed as a *means* for fulfilling the goals for which the information is sought, it would perform the role prescribed by the present library system with or without the word "library" in it). However, if the technology

would become a *goal in itself* and consequently, persuading or forcing the user to change his goals to satisfy those of the "new approach" by limiting, for instance, the type of inquiries to those previously programmed in the computer, it would replace the concept of the library system by one foreign to the philosophy of contemporary librarianship.

SUMMARY AND CONCLUSIONS

The purpose of this paper is to construct a model of the library system by identifying the fundamental terms and relations involved in the analysis of the notion of a "library" and to utilize this model in describing the patterns of library change. This construction is analogous to the construction of models in logic and in the natural sciences, although there are some basic differences, the most important of which are that the terms of the proposed model represent concepts, not measurable quantities, and the model is descriptive rather than predictive .

The model is constructed on two distinct levels of abstraction. A static model of library structure is constructed that is concerned with the more general, unchanging aspects of the structure of a library. The static model is developed into a dynamic model of library change that presents a deeper analysis of certain factors of the static system leading to the consideration of the relations ε, e, and a as subsystems and involving the internal the structure of B, U, and K implicitly.

Two kinds of change are distinguished. External change takes place in the formators M, N, and G and is essentially outside the scope of the library system. Internal change assumes M, N, and G to be constant and it takes place within the library system with e, ε, and a tending toward an equilibrium for the system as a whole. Formator F takes on a central role as the common referent of three subsystems e, ε, and a.

The approach used in the development of the proposed model has certain inherent methodological difficulties. The first is the use of mathematical notions, for the use of mathematics is by way of analogy rather than by direct connection. For example, while B, U, and K do at times seem to be treated as mathematical quantities, especially in the basic law of structure, they are not to be conceived as in any real sense measurable. Rather, their behavior is sometimes *analogous* to that of quantities. As a result of this relation of analogy rather than identity with mathematical concepts, the theory cannot be "tested" in the classical sense of the word. The model can serve to explain or to illustrate, but never to predict, the behavior of a library.

The second is in the area of certain minor aspects of the behavior of a system which do not seem to agree with the actual behavior of a library system. One of these arises in the attempt to interpret the constants in Propositions 1 and 2 in dynamic terms. While Δ can be interpreted as some measure of the "degree of competence" of the library, any attempt to interpret Σ and Ω as measures of social and

operational aspects of utility fails for basic mathematical reasons inherent in the formula. Another difficulty lies in the distinction between relative and absolute equilibrium. The model requires motion toward relative equilibrium and cannot account for the situation, say, of the far-sighted administrator making changes which aim at long-range improvement (i.e., absolute equilibrium) but are worse in the short-range.

There are at least two directions in which this model needs to be developed. One is to re-evaluate the model in a historical perspective to determine if the theory needs revision on the basis of the detailed past experience of libraries. The other is to study the structure of s, e, and a in further detail. This paper has only sketched a notion of the general structure of these relations without enumerating the various factors that enter their constitution.

Librarianship is an applied, service-oriented discipline. Its structure is expressed in terms of empirical procedures of operation. The concept of operation itself is based on the feed-back principle of change, for any quantitative change between the primary terms (B, U, K) is either reinforced, modified, or rectified in terms of the successful fulfillment of expectation.

Librarianship is also a social institution, serving the individual patrons as representative members of a given society. The services of the library are public, not private; hence, the quality of its services is aimed at the maximization of its own utility which can be achieved only by aiming at the equilibrium of social values. The changes themselves are effected by changing the emphases on the relative significance of the qualitative concepts of the library. The implied principle is that of Gestalt. It is a total given state of affairs that predetermines the evaluation of the past concepts and the anticipation of new concepts in the future.

Finally, librarianship, as any other purposeful organization, is goal oriented. It hypothesizes its goals for the sole purpose of providing directiveness to its own growth. The only possible method in setting up the patterns of change is a logical postulation of its own mission. The stress in on the future and this sets the terms in which past and present achievements are analyzed. A conceptual pattern incorporating the past empirical experiences, the contemporary social values, and the plans for future growth, constitutes the essence of the model for the Library System outlined in this paper.

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